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<110> William Gaarde
      Susan M. Freier
      Andrew T. Watt

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atacccctgg aaaactgaag cccgtggagc aatgatctct acaggactgc ttcaaggctg    240
atgggaacca ccctgtagag gtccatctgc gttcagaccc agacgatgcc agagctatga    300
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ctgggcctgc aggtgtggcg ccgaggggag atcagcc atg gag cag cca cag gag   355
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gaa gcc cct gag gtc cgg gaa gag gag gag aaa gag gaa gtg gca gag   403
Glu Ala Pro Glu Val Arg Glu Glu Glu Glu Lys Glu Glu Val Ala Glu
            10   15   20

gca gaa gga gcc cca gag ctc aat ggg gga cca cag cat gca ctt cct   451
Ala Glu Gly Ala Pro Glu Leu Asn Gly Gly Pro Gln His Ala Leu Pro
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tcc agc agc tac aca gac ctc tcc cgg agc tcc tcg cca ccc tca ctg   499
Ser Ser Ser Tyr Thr Asp Leu Ser Arg Ser Ser Ser Pro Pro Ser Leu
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ctg gac caa ctg cag atg ggc tgt gac ggg gcc tca tgc ggc agc ctc   547
Leu Asp Gln Leu Gln Met Gly Cys Asp Gly Ala Ser Cys Gly Ser Leu
55   60   65   70

aac atg gag tgc cgg gtg tgc ggg gac aag gca tcg ggc ttc cac tac   595
Asn Met Glu Cys Arg Val Cys Gly Asp Lys Ala Ser Gly Phe His Tyr
                75   80   85

ggt gtt cat gca tgt gag ggg tgc aag ggc ttc ttc cgt cgt acg atc   643
Gly Val His Ala Cys Glu Gly Cys Lys Gly Phe Phe Arg Arg Thr Ile
            90   95   100

cgc atg aag ctg gag tac gag aag tgt gag cgc agc tgc aag att cag   691
Arg Met Lys Leu Glu Tyr Glu Lys Cys Glu Arg Ser Cys Lys Ile Gln
            105   110   115

aag aag aac cgc aac aag tgc cag tac tgc cgc ttc cag aag tgc ctg   739
Lys Lys Asn Arg Asn Lys Cys Gln Tyr Cys Arg Phe Gln Lys Cys Leu
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gca ctg ggc atg tca cac aac gct atc cgt ttt ggt cgg atg ccg gag   787
Ala Leu Gly Met Ser His Asn Ala Ile Arg Phe Gly Arg Met Pro Glu
135   140   145   150

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gct gag aag agg aag ctg gtg gca ggg ctg act gca aac gag ggg agc       835
Ala Glu Lys Arg Lys Leu Val Ala Gly Leu Thr Ala Asn Glu Gly Ser
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cag tac aac cca cag gtg gcc gac ctg aag gcc ttc tcc aag cac atc       883
Gln Tyr Asn Pro Gln Val Ala Asp Leu Lys Ala Phe Ser Lys His Ile
                170                 175                 180


tac aat gcc tac ctg aaa aac ttc aac atg acc aaa aag aag gcc cgc       931
Tyr Asn Ala Tyr Leu Lys Asn Phe Asn Met Thr Lys Lys Lys Ala Arg
                185                 190                 195


agc atc ctc acc ggc aaa gcc agc cac acg gcg ccc ttt gtg atc cac       979
Ser Ile Leu Thr Gly Lys Ala Ser His Thr Ala Pro Phe Val Ile His
                200                 205                 210


gac atc gag aca ttg tgg cag gca gag aag ggg ctg gtg tgg aag cag      1027
Asp Ile Glu Thr Leu Trp Gln Ala Glu Lys Gly Leu Val Trp Lys Gln
215                 220                 225                 230


ttg gtg aat ggc ctg cct ccc tac aag gag atc agc gtg cac gtc ttc      1075
Leu Val Asn Gly Leu Pro Pro Tyr Lys Glu Ile Ser Val His Val Phe
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tac cgc tgc cag tgc acc aca gtg gag acc gtg cgg gag ctc act gag      1123
Tyr Arg Cys Gln Cys Thr Thr Val Glu Thr Val Arg Glu Leu Thr Glu
                250                 255                 260


ttc gcc aag agc atc ccc agc ttc agc agc ctc ttc ctc aac gac cag      1171
Phe Ala Lys Ser Ile Pro Ser Phe Ser Ser Leu Phe Leu Asn Asp Gln
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gtt acc ctt ctc aag tat ggc gtg cac gag gcc atc ttc gcc atg ctg      1219
Val Thr Leu Leu Lys Tyr Gly Val His Glu Ala Ile Phe Ala Met Leu
                280                 285                 290


gcc tct atc gtc aac aag gac ggg ctg ctg gta gcc aac ggc agt ggc      1267
Ala Ser Ile Val Asn Lys Asp Gly Leu Leu Val Ala Asn Gly Ser Gly
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```
295                    300                    305                    310
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ttt gtc acc cgt gag ttc ctg cgc agc ctc cgc aaa ccc ttc agt gat        1315
Phe Val Thr Arg Glu Phe Leu Arg Ser Leu Arg Lys Pro Phe Ser Asp
                315                    320                    325
```

```
atc att gag cct aag ttt gaa ttt gct gtc aag ttc aac gcc ctg gaa        1363
Ile Ile Glu Pro Lys Phe Glu Phe Ala Val Lys Phe Asn Ala Leu Glu
                330                    335                    340
```

```
ctt gat gac agt gac ctg gcc cta ttc att gcg gcc atc att ctg tgt        1411
Leu Asp Asp Ser Asp Leu Ala Leu Phe Ile Ala Ala Ile Ile Leu Cys
                345                    350                    355
```

```
gga gac cgg cca ggc ctc atg aac gtt cca cgg gtg gag gct atc cag        1459
Gly Asp Arg Pro Gly Leu Met Asn Val Pro Arg Val Glu Ala Ile Gln
           360                    365                    370
```

```
gac acc atc ctg cgt gcc ctc gaa ttc cac ctg cag gcc aac cac cct        1507
Asp Thr Ile Leu Arg Ala Leu Glu Phe His Leu Gln Ala Asn His Pro
375                    380                    385                    390
```

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gat gcc cag tac ctc ttc ccc aag ctg ctg cag aag atg gct gac ctg        1555
Asp Ala Gln Tyr Leu Phe Pro Lys Leu Leu Gln Lys Met Ala Asp Leu
                395                    400                    405
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cgg caa ctg gtc acc gag cac gcc cag atg atg cag cgg atc aag aag        1603
Arg Gln Leu Val Thr Glu His Ala Gln Met Met Gln Arg Ile Lys Lys
                410                    415                    420
```

```
acc gaa acc gag acc tcg ctg cac cct ctg ctc cag gag atc tac aag        1651
Thr Glu Thr Glu Thr Ser Leu His Pro Leu Leu Gln Glu Ile Tyr Lys
           425                    430                    435
```

```
gac atg tac taa cggcggcacc caggcctccc tgcagactcc aatggggcca           1703
Asp Met Tyr
       440
```

```
gcactggagg ggcccaccca catgactttt ccattgacca gctctcttcc tgtctttgtt     1763
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gaacaggacc tctgcttttg cacacctttt ccccaggagc agaagagagt gggcctgccc   2003

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cagcttcctg tgtttttaat ataaatagtg tacacagact gacgaaactt taaataaatg   3263

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ccatcagcaa cattggcctg   20

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ggccatcagc aacattggcc   20

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tgcatggtgc ctgcaggtaa   20

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gcaggcccct ctctctgggt   20

<210> 81
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aggacctgca ggacccctgc   20

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gaagctccca ctgggcgagg   20

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tcccgggaag ctcccactgg   20

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tcagaatgaa caggctcagt   20

<210> 85
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gggacaaatg gacatcagaa   20

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agagctattg ggacaaatgg   20

<210> 87
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ggagggcagt agagctattg   20

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<400> 88
ggacactaga ggctgtgcag   20

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gccctgctct gaggtgagcg   20

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ctgcgccgct cagacatggc   20

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aggaagcctg ggcttgaacc   20

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acttccaccc agagtcacat   20

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gagcgggaag aatcctgcca   20

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tcatagcctt ggctgaaaga   20

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gctcctagca aaaatataca                                              20


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<400> 96
tcgtcagtct gtgtacacta                                             20


<210> 97
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agatggtggc agagctatga ccaggcctgc aggcgccacg ccaagtgggg gtcagtc   57

atg gaa cag cca cag gag gag acc cct gag gcc cgg gaa gag gag aaa   105
Met Glu Gln Pro Gln Glu Glu Thr Pro Glu Ala Arg Glu Glu Glu Lys
1   5   10   15

gag gaa gtg gcc atg ggt gac gga gcc ccg gag ctc aat ggg gga cca   153
Glu Glu Val Ala Met Gly Asp Gly Ala Pro Glu Leu Asn Gly Gly Pro
            20   25   30

gaa cac acg ctt cct tcc agc agc tgt gca gac ctc tcc cag aat tcc   201
Glu His Thr Leu Pro Ser Ser Ser Cys Ala Asp Leu Ser Gln Asn Ser
        35   40   45

tcc cct tcc tcc ctg ctg gac cag ctg cag atg ggc tgt gat ggg gcc   249
Ser Pro Ser Ser Leu Leu Asp Gln Leu Gln Met Gly Cys Asp Gly Ala
    50   55   60

tca ggc ggc agc ctc aac atg gaa tgt cgg gtg tgc ggg gac aag gcc   297
Ser Gly Gly Ser Leu Asn Met Glu Cys Arg Val Cys Gly Asp Lys Ala
65   70   75   80

tcg ggc ttc cac tac ggg gtc cac gcg tgc gag ggg tgc aag ggc ttc   345
Ser Gly Phe His Tyr Gly Val His Ala Cys Glu Gly Cys Lys Gly Phe
                85   90   95

ttc cgc cgg aca atc cgc atg aag ctc gag tat gag aag tgc gat cgg   393
Phe Arg Arg Thr Ile Arg Met Lys Leu Glu Tyr Glu Lys Cys Asp Arg
            100   105   110

atc tgc aag atc cag aag aag aac cgc aac aag tgt cag tac tgc cgc   441
Ile Cys Lys Ile Gln Lys Lys Asn Arg Asn Lys Cys Gln Tyr Cys Arg
        115   120   125

ttc cag aag tgc ctg gca ctc ggc atg tcg cac aac gct atc cgc ttt   489
Phe Gln Lys Cys Leu Ala Leu Gly Met Ser His Asn Ala Ile Arg Phe

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           130                    135                    140

gga cgg atg ccg gag gcc gag aag agg aag ctg gtg gcg ggg ctg act        537
Gly Arg Met Pro Glu Ala Glu Lys Arg Lys Leu Val Ala Gly Leu Thr
145                 150                    155                 160

gcc agc gag ggg tgc cag cac aac ccc cag ctg gcc gac ctg aag gcc        585
Ala Ser Glu Gly Cys Gln His Asn Pro Gln Leu Ala Asp Leu Lys Ala
                    165                    170                 175

ttc tct aag cac atc tac aac gcc tac ctg aaa aac ttc aac atg acc        633
Phe Ser Lys His Ile Tyr Asn Ala Tyr Leu Lys Asn Phe Asn Met Thr
                180                    185                    190

aaa aag aag gcc cgg agc atc ctc acc ggc aag tcc agc cac aac gca        681
Lys Lys Lys Ala Arg Ser Ile Leu Thr Gly Lys Ser Ser His Asn Ala
            195                    200                    205

ccc ttt gtc atc cac gac atc gag aca ctg tgg cag gca gag aag ggc        729
Pro Phe Val Ile His Asp Ile Glu Thr Leu Trp Gln Ala Glu Lys Gly
        210                    215                    220

ctg gtg tgg aaa cag ctg gtg aac ggg ctg ccg ccc tac aac gag atc        777
Leu Val Trp Lys Gln Leu Val Asn Gly Leu Pro Pro Tyr Asn Glu Ile
225                 230                    235                 240

agt gtg cac gtg ttc tac cgc tgc cag tcc acc aca gtg gag aca gtc        825
Ser Val His Val Phe Tyr Arg Cys Gln Ser Thr Thr Val Glu Thr Val
                    245                    250                 255

cga gag ctc acc gag ttc gcc aag aac atc ccc aac ttc agc agc ctc        873
Arg Glu Leu Thr Glu Phe Ala Lys Asn Ile Pro Asn Phe Ser Ser Leu
                260                    265                    270

ttc ctc aat gac cag gtg acc ctc ctc aag tat ggc gtg cac gag gcc        921
Phe Leu Asn Asp Gln Val Thr Leu Leu Lys Tyr Gly Val His Glu Ala
                275                    280                    285

atc ttt gcc atg ctg gcc tcc atc gtc aac aaa gac ggg ctg ctg gtg        969
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Ile Phe Ala Met Leu Ala Ser Ile Val Asn Lys Asp Gly Leu Leu Val
    290                 295                 300

gcc aac ggc agt ggc ttc gtc acc cac gag ttc ttg cga agt ctc cgc    1017
Ala Asn Gly Ser Gly Phe Val Thr His Glu Phe Leu Arg Ser Leu Arg
305                 310                 315                 320

aag ccc ttc agt gac atc att gag ccc aag ttc gag ttt gct gtc aag    1065
Lys Pro Phe Ser Asp Ile Ile Glu Pro Lys Phe Glu Phe Ala Val Lys
                    325                 330                 335

ttc aat gcg ctg gag ctc gat gac agt gac ctg gcg ctc ttc atc gcg    1113
Phe Asn Ala Leu Glu Leu Asp Asp Ser Asp Leu Ala Leu Phe Ile Ala
                340                 345                 350

gcc atc att ctg tgt gga gac cgg cca ggc ctc atg aat gtg ccc cag    1161
Ala Ile Ile Leu Cys Gly Asp Arg Pro Gly Leu Met Asn Val Pro Gln
            355                 360                 365

gta gaa gcc atc cag gac acc att ctg cgg gct cta gaa ttc cat ctg    1209
Val Glu Ala Ile Gln Asp Thr Ile Leu Arg Ala Leu Glu Phe His Leu
    370                 375                 380

cag gtc aac cac cct gac agc cag tac ctc ttc ccc aag ctg ctg cag    1257
Gln Val Asn His Pro Asp Ser Gln Tyr Leu Phe Pro Lys Leu Leu Gln
385                 390                 395                 400

aag atg gca gac ctg cgg cag ctg gtc act gag cat gcc cag atg atg    1305
Lys Met Ala Asp Leu Arg Gln Leu Val Thr Glu His Ala Gln Met Met
                    405                 410                 415

cag tgg cta aag aag acg gag agt gag acc ttg ctg cac ccc ctg ctc    1353
Gln Trp Leu Lys Lys Thr Glu Ser Glu Thr Leu Leu His Pro Leu Leu
                420                 425                 430

cag gaa atc tac aag gac atg tac taa ggccgcagcc caggcctccc    1400
Gln Glu Ile Tyr Lys Asp Met Tyr
            435                 440
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ctcaggctct gctgggccca gccacggact gttcagagga ccagccacag gcactggcag    1460
tcaagcagct agagcctact cacaacactc cagacacgtg gcccagactc tcccccaaca    1520
cccccacccc caccaacccc cc                                            1542
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<210> 98
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<213> M. musculus

<220>

<400> 98
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gaggcggccg ggacagtgct gtgcagcggt gtgggtatgc gcatgggact cactcagagg    120
ctcctgctca ctgacagatg aagacaaacc cacggtaaag gcagtccatc tgcgctcaga    180
cccagatggt ggcagagcta tgaccaggcc tgcaggcgcc acgccaagtg ggggtcagtc    240
atggaacagc cacaggagga gacccctgag gcccgggaag aggagaaaga ggaagtggcc    300
atgggtgacg gagccccgga gctcaatggg ggaccaaaac aaacaaacaa acaagcaaac    360
aaaaaaacta cagtcaaaat ctaatttgaa aaatatttct gcctttatta ttacttattt    420
gattttgggc cctgggagaa tggactgagg tacataattt acattgcaaa gcagacccag    480
ggacg                                                              485
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<212> DNA
<213> M. musculus

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Met Glu Gln Pro Gln Glu Glu Thr Pro Glu Ala Arg Glu Glu Glu Lys
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 1                 5                 10                15

gag gaa gtg gcc atg ggt gac gga gcc ccg gag ctc aat ggg gga cca        96
Glu Glu Val Ala Met Gly Asp Gly Ala Pro Glu Leu Asn Gly Gly Pro
            20                25                30


gaa cac acg ctt cct tcc agc agc tgt gca gac ctc tcc cag aat tcc       144
Glu His Thr Leu Pro Ser Ser Ser Cys Ala Asp Leu Ser Gln Asn Ser
        35                40                45


tcc cct tcc tcc ctg ctg gac cag ctg cag atg ggc tgt gat ggg gcc      192
Ser Pro Ser Ser Leu Leu Asp Gln Leu Gln Met Gly Cys Asp Gly Ala
    50                55                60


tca ggc ggc agc ctc aac atg gaa tgt cgg gtg tgc ggg gac aag gcc      240
Ser Gly Gly Ser Leu Asn Met Glu Cys Arg Val Cys Gly Asp Lys Ala
65                70                75                80


tcg ggc ttc cac tac ggg gtc cac gcg tgc gag ggg tgc aag ggc ttc      288
Ser Gly Phe His Tyr Gly Val His Ala Cys Glu Gly Cys Lys Gly Phe
                85                90                95


ttc cgc cgg aca atc cgc atg aag ctc gag tat gag aag tgc gat cgg      336
Phe Arg Arg Thr Ile Arg Met Lys Leu Glu Tyr Glu Lys Cys Asp Arg
            100                105                110


atc tgc aag atc cag aag aag aac cgc aac aag tgt cag tac tgc cgc      384
Ile Cys Lys Ile Gln Lys Lys Asn Arg Asn Lys Cys Gln Tyr Cys Arg
        115                120                125


ttc cag aag tgc ctg gca ctc ggc atg tcg cac aac gct atc cgc ttt      432
Phe Gln Lys Cys Leu Ala Leu Gly Met Ser His Asn Ala Ile Arg Phe
    130                135                140


gga cgg atg ccg gac ggc gag aag agg aag ctg gtg gcg ggg ctg act      480
Gly Arg Met Pro Asp Gly Glu Lys Arg Lys Leu Val Ala Gly Leu Thr
145                150                155                160


gcc agc gag ggg tgc cag cac aac ccc cag ctg gcc gac ctg aag gcc      528
```

Ala Ser Glu Gly Cys Gln His Asn Pro Gln Leu Ala Asp Leu Lys Ala
                165   170   175

ttc tct aag cac atc tac aac gcc tac ctg aaa aac ttc aac atg acc   576
Phe Ser Lys His Ile Tyr Asn Ala Tyr Leu Lys Asn Phe Asn Met Thr
                180   185   190

aaa aag aag gcc cgg agc atc ctc acc ggc aag tcc agc cac aac gca   624
Lys Lys Lys Ala Arg Ser Ile Leu Thr Gly Lys Ser Ser His Asn Ala
                195   200   205

ccc ttt gtc atc cac gac atc gag aca ctg tgg cag gca gag aag ggc   672
Pro Phe Val Ile His Asp Ile Glu Thr Leu Trp Gln Ala Glu Lys Gly
            210   215   220

ctg gtg tgg aaa cag ctg gtg aac ggg ctg ccg ccc tac aac gag atc   720
Leu Val Trp Lys Gln Leu Val Asn Gly Leu Pro Pro Tyr Asn Glu Ile
225   230   235   240

agt gtg cac gtg ttc tac cgc tgc cag tcc acc aca gtg gag aca gtc   768
Ser Val His Val Phe Tyr Arg Cys Gln Ser Thr Thr Val Glu Thr Val
                245   250   255

cga gag ctc acc gag ttc gcc aag aac atc ccc aac ttc agc agc ctc   816
Arg Glu Leu Thr Glu Phe Ala Lys Asn Ile Pro Asn Phe Ser Ser Leu
                260   265   270

ttc ctc aat gac cag gtg acc ctc ctc aag tat ggc gtg cac gag gcc   864
Phe Leu Asn Asp Gln Val Thr Leu Leu Lys Tyr Gly Val His Glu Ala
                275   280   285

atc ttt gcc atg ctg gcc tcc atc gtc aac aaa gac ggg ctg ctg gtg   912
Ile Phe Ala Met Leu Ala Ser Ile Val Asn Lys Asp Gly Leu Leu Val
                290   295   300

gcc aac ggc agt ggc ttc gtc acc cac gag ttc ttg cga agt ctc cgc   960
Ala Asn Gly Ser Gly Phe Val Thr His Glu Phe Leu Arg Ser Leu Arg
305   310   315   320

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aag ccc ttc agt gac atc att gag ccc aag ttc gag ttt gct gtc aag   1008
Lys Pro Phe Ser Asp Ile Ile Glu Pro Lys Phe Glu Phe Ala Val Lys
                325                 330                 335


ttc aat gcg ctg gag ctc gat gac agt gac ctg gcg ctc ttc atc gcg   1056
Phe Asn Ala Leu Glu Leu Asp Asp Ser Asp Leu Ala Leu Phe Ile Ala
                340                 345                 350


gcc atc att ctg tgt gga gac cgg cca ggc ctc atg aat gtg ccc cag   1104
Ala Ile Ile Leu Cys Gly Asp Arg Pro Gly Leu Met Asn Val Pro Gln
            355                 360                 365


gta gaa gcc atc cag gac acc att ctg cgg gct cta gaa ttc cat ctg   1152
Val Glu Ala Ile Gln Asp Thr Ile Leu Arg Ala Leu Glu Phe His Leu
        370                 375                 380


cag gtc aac cac cct gac agc cag tac ctc ttc ccc aag ctg ctg cag   1200
Gln Val Asn His Pro Asp Ser Gln Tyr Leu Phe Pro Lys Leu Leu Gln
385                 390                 395                 400


aag atg gca gac ctg cgg cag ctg gtc act gag cat gcc cag atg atg   1248
cag tgg cta aag aag acg gag agt gag acc ttg ctg cac ccc ctg ctc   1296
cag gaa atc tac aag gac atg tac taa                                1323
Gln Glu Ile Tyr Lys Asp Met Tyr
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<400> 101
ctgaccccca cttggcgtgg   20

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cctgtggctg ttccatgact   20

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tgggcccagc agagcctgag   20

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tctgaacagt ccgtggctgg   20

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gccagtgcct gtggctggtc   20

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gttgtgagta ggctctagct   20

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<400> 107
ccacgtgtct ggagtgttgt   20

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tgcacagcac tgtcccggcc   20

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tgtcttcatc tgtcagtgag   20

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agcgcagatg gactgccttt   20

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<400> 111
accatctggg tctgagcgca   20

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tctcccaggg cccaaaatca   20

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gtccctgggt ctgctttgca   20

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<400> 115
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<210> 116
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<400> 116
ggccacttcc tctttctcct   20

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gttctggtcc cccattgagc   20

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<400> 120
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acagcccatc tgcagctggt   20

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gaggccccat cacagcccat   20

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cgacattcca tgttgaggct   20

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cttcatgcgg attgtccggc   20

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gaaggccttc aggtcggcca   20

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gactggcagc ggtagaacac   20

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tcttggcgaa ctcggtgagc   20

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gatgttcttg gcgaactcgg   20

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<211> 20
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aagaggctgc tgaagttggg   20

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